

In the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims

1. **(Withdrawn)** A method of authenticating a hardware token, comprising the steps of:
 - generating a host fingerprint F;
 - transmitting the fingerprint to an authorizing device;
 - receiving a random value R from the authorizing device;
 - computing a challenge R', the challenge R' derived at least in part from the fingerprint F and a random number R;
 - transmitting the challenge R' to the hardware token;
 - receiving a response X from the hardware token, the response X generated at least in part from the challenge R'; and
 - transmitting the response X to the authorizing device.

2. **(Withdrawn)** The method of claim 1, wherein the step of generating the fingerprint comprises the steps of:
 - collecting host information C; and
 - forming the fingerprint F at least in part from the host information C.

3. **(Withdrawn)** The method of claim 2, wherein the step of forming the fingerprint F from the host information C comprises the step of hashing the host information C.

4. **(Withdrawn)** The method of claim 2, wherein:
the method further comprises the step of receiving authorizing device specific value V;
and
the step of forming the fingerprint F at least in part from the host information C comprises the step of forming the fingerprint F at least in part from the host information C and the authorizing device specific value V.

5. **(Withdrawn)** The method of claim 4, wherein the step of forming the fingerprint F at least in part from the host information C and the authorizing device specific value V comprises the step of forming the fingerprint F at least in part from a hash of the host information C and the authorizing device specific value V.

6. **(Withdrawn)** The method of claim 4, wherein the step of forming the fingerprint F at least in part from the host information C and the authorizing device specific value V comprises the step of forming the fingerprint F at least in part from a concatenation of the host information C and the authorizing device specific value V.

7. **(Withdrawn)** The method of claim 2, wherein the host comprises a computer communicatively coupleable to the authorizing device and the hardware token, and the host information C includes information selected from the group comprising:

processor serial number;
hard drive serial number;
network interface MAC address;
BIOS code checksum;
operating system; and
system directory timestamp.

8. **(Withdrawn)** The method of claim 1, further comprising the step of:
receiving an authentication message from the authorizing device if the transmitted
response X matches an expected response X' generated by the authenticating device at least in
part from the fingerprint F and the random number R.

9. **(Withdrawn)** The method of claim 1, wherein the response X is generated from a
shared secret S between the authorizing device and the hardware token.

10. **(Withdrawn)** The method of claim 9, wherein the response X is the challenge R'
encrypted by the shared secret S.

11. **(Withdrawn)** The method of claim 1, wherein the response X is generated from a
private key K_{pr} of a of a key pair having the private key K_{pr} accessible to the token and a public
key K_{pu} accessible to the authorizing device.

12. **(Withdrawn)** An apparatus for authenticating a hardware token, comprising:

means for generating a host fingerprint F;

means for transmitting the fingerprint to an authorizing device;

means for receiving a random value R from the authorizing device;

means for computing a challenge R', the challenge R' derived at least in part from the fingerprint F and a random number R;

means for transmitting the challenge R' to the hardware token;

means for receiving a response X from the hardware token, the response X generated at least in part from the challenge R'; and

means for transmitting the response X to the authorizing device.

13. **(Withdrawn)** The apparatus of claim 12, wherein the means for generating the fingerprint comprises:

means for collecting host information C; and

means for forming the fingerprint F at least in part from the host information C.

14. **(Withdrawn)** The apparatus of claim 13, wherein the means for forming the fingerprint F from the host information C comprises means for hashing the host information C.

15. **(Withdrawn)** The apparatus of claim 13, wherein:

the apparatus further comprises means for receiving authorizing device specific value V;

and

the means for forming the fingerprint F at least in part from the host information C comprises means for forming the fingerprint F at least in part from the host information C and the authorizing device specific value V.

16. **(Withdrawn)** The apparatus of claim 15, wherein the means for forming the fingerprint F at least in part from the host information C and the authorizing device specific value V comprises means for forming the fingerprint F at least in part from a hash of the host information C and the authorizing device specific value V.

17. **(Withdrawn)** The apparatus of claim 15, wherein the means for forming the fingerprint F at least in part from the host information C and the authorizing device specific value V comprises the means for forming the fingerprint F at least in part from a concatenation of the host information C and the authorizing device specific value V.

18. **(Withdrawn)** The apparatus of claim 13, wherein the host comprises a computer communicatively coupleable to the authorizing device and the hardware token, and the host information C includes information selected from the group comprising:

- processor serial number;
- hard drive serial number;
- network interface MAC address;
- BIOS code checksum;
- operating system; and
- system directory timestamp.

19. **(Withdrawn)** The apparatus of claim 12, further comprising:
means for receiving an authentication message from the authorizing device if the transmitted response X matches an expected response X' generated by the authenticating device at least in part from the fingerprint F and the random number R.

20. **(Withdrawn)** The apparatus of claim 12, wherein the response X is generated from a shared secret S between the authorizing device and the hardware token.

21. **(Withdrawn)** The apparatus of claim 20, wherein the response X is the challenge R' encrypted by the shared secret S.

22. **(Withdrawn)** The apparatus of claim 12, wherein the response X is generated from a private key K_{pr} of a key pair having the private key K_{pr} accessible to the token and a public key K_{pu} accessible to the authorizing device.

23. **(Withdrawn)** A computer for authenticating a hardware token, the computer having a processor communicatively coupled to a memory storing instructions for performing steps of:

generating a host fingerprint F;

transmitting the fingerprint to an authorizing device;

receiving a random value R from the authorizing device;

computing a challenge R' , the challenge R' derived at least in part from the fingerprint F and a random number R ;

transmitting the challenge R' to the hardware token;

receiving a response X from the hardware token, the response X generated at least in part from the challenge R' ; and

transmitting the response X to the authorizing device.

24. **(Withdrawn)** The apparatus of claim 23, wherein the instructions for generating the fingerprint comprise instructions for performing steps of:

collecting host information C ; and

forming the fingerprint F at least in part from the host information C .

25. **(Withdrawn)** The apparatus of claim 24, wherein the instructions for forming the fingerprint F from the host information C comprise instructions for hashing the host information C .

26. **(Withdrawn)** The apparatus of claim 24, wherein:
the computer further receives an authorizing device specific value V ; and
the instructions for forming the fingerprint F at least in part from the host information C comprise instructions for forming the fingerprint F at least in part from the host information C and the authorizing device specific value V .

27. **(Withdrawn)** The apparatus of claim 26, wherein the instructions for forming the fingerprint F at least in part from the host information C and the authorizing device specific value V comprise instructions for forming the fingerprint F at least in part from a hash of the host information C and the authorizing device specific value V.

28. **(Withdrawn)** The apparatus of claim 26, wherein the instructions for forming the fingerprint F at least in part from the host information C and the authorizing device specific value V comprise instructions for forming the fingerprint F at least in part from a concatenation of the host information C and the authorizing device specific value V.

29. **(Withdrawn)** The apparatus of claim 24, wherein the host comprises a computer communicatively coupleable to the authorizing device and the hardware token, and the host information C includes information selected from the group comprising:

- processor serial number;
- hard drive serial number;
- network interface MAC address;
- BIOS code checksum;
- operating system; and
- system directory timestamp.

30. **(Withdrawn)** The apparatus of claim 23, wherein the instructions further comprise:

instructions for receiving an authentication message from the authorizing device if the transmitted response X matches an expected response X' generated by the authenticating device at least in part from the fingerprint F and the random number R.

31. **(Withdrawn)** The apparatus of claim 23, wherein the response X is generated from a shared secret S between the authorizing device and the hardware token.

32. **(Withdrawn)** The apparatus of claim 31, wherein the response X is the challenge R' encrypted by the shared secret S.

33. **(Withdrawn)** The apparatus of claim 23, wherein the response X is generated from a private key K_{pr} of a of a key pair having the private key K_{pr} accessible to the token and a public key K_{pu} accessible to the authorizing device.

34. **(Currently Amended)** A method of authenticating a hardware token for operation with a host, comprising ~~the steps of:~~

retrieving a value X from a memory accessible to an authenticating entity, the value X generated from a computer fingerprint F of the host and an identifier P securing access to the token, wherein the host fingerprint F is computed at least in part from host information C;

regenerating the same identifier value P at least in part from the value X and the fingerprint F; and

transmitting the regenerated identifier P to the token to authenticate the token for operation with the host.

35. Canceled

36. (Original) The method of claim 34, wherein the host fingerprint F is computed at least in part from host information C and a server specific value V .

37. (Original) The method of claim 34, wherein the host fingerprint F is computed at least in part from host information C , a server specific value V and a fixed string Z .

38. (Original) The method of claim 34, wherein the value X is computed in the token.

39. (Original) The method of claim 34, wherein the value X is computed according to $X = f(P, F)$, wherein $f(P, F)$ is a reversible function such that $f(f(P, F), F) = P$.

40. (Original) The method of claim 39, wherein $f(P, F)$ comprises $P \text{ XOR } F$.

41. (Original) The method of claim 34, wherein the value X is further computed at least in part from a user identifier U .

42. (Original) The method of claim 41, wherein the value X is computed according to $X = f(P, U, F)$, wherein $f(P, U, F)$ is a reversible function such that $f(f(P, U, F), U, F) = P$.

43. (Original) The method of claim 42, wherein $f(P, U, F)$ is $P \text{ XOR } U \text{ XOR } F$.

44. **(Original)** The method of claim 34, wherein:

the authorizing entity is a host computer communicatively coupleable to the token; and
the value X is stored in the host computer.

45. **(Original)** The method of claim 34, wherein the value X is stored in a memory accessible to the authentication entity by performing steps comprising the steps of:

computing a reference value H associated with the value X; and
associably storing the value X and the reference value H in a memory of the token.

46. **(Original)** The method of claim 45, wherein the step of retrieving the value X comprises the steps of:

computing the reference value H at least in part from the fingerprint F; and
retrieving the value X associated with the reference value H

47. **(Original)** The method of claim 46, wherein the step of computing the reference value H at least in part from the fingerprint F comprises the step of computing H as a hash of the fingerprint F.

48. **(Original)** The method of claim 45, wherein the reference value H is computed at least in part from a hash of the fingerprint F.

49. **(Currently Amended)** An apparatus for authenticating a hardware token for operation with a host, comprising:

means for retrieving a value X from a memory accessible to an authenticating entity, the value X generated from a computer fingerprint F of the host and an identifier P securing access to the token, wherein the host fingerprint F is computed at least in part from host information C;

means for regenerating the same identifier value P at least in part from the value X and the fingerprint F; and

means for transmitting the regenerated identifier P to the token to authenticate the token for operation with the host.

50. **Canceled**

51. **(Original)** The apparatus of claim 49, wherein the host fingerprint F is computed at least in part from host information C and a server specific value V.

52. **(Original)** The apparatus of claim 49, wherein the host fingerprint F is computed at least in part from host information C, a server specific value V and a fixed string Z.

53. **(Original)** The apparatus of claim 49, wherein the value X is computed in the token.

54. **(Original)** The apparatus of claim 49, wherein the value X is computed according to $X = f(P, F)$, wherein $f(P, F)$ is a reversible function such that $f(f(P, F), F) = P$.

55. **(Original)** The apparatus of claim 54, wherein $f(P, F)$ comprises $P \text{ XOR } F$.
56. **(Original)** The apparatus of claim 49, wherein the value X is further computed at least in part from a user identifier U .
57. **(Original)** The apparatus of claim 56, wherein the value X is computed according to $X = f(P, U, F)$, wherein $f(P, U, F)$ is a reversible function such that $f(f(P, U, F), U, F) = P$.
58. **(Original)** The apparatus of claim 57, wherein $f(P, U, F)$ is $P \text{ XOR } U \text{ XOR } F$.
59. **(Original)** The apparatus of claim 49, wherein:
the authorizing entity is a host computer communicatively coupleable to the token; and
the value X is stored in the host computer.
60. **(Original)** The apparatus of claim 49, wherein the value X is stored in a memory of the hardware token, and wherein the hardware token further comprises:
means for computing a reference value H associated with the value X ; and
means for associably storing the value X and the reference value H in a memory of the token.
61. **(Original)** The apparatus of claim 60, wherein the means for retrieving the value

X comprises:

means for computing the reference value H at least in part from the fingerprint F; and
means for retrieving the value X associated with the reference value H.

62. **(Original)** The apparatus of claim 61, wherein the means for computing the reference value H at least in part from the fingerprint F comprises means for computing H as a hash of the fingerprint F.

63. **(Original)** The apparatus of claim 60, wherein the reference value H is computed at least in part from a hash of the fingerprint F.

64. **(Currently Amended)** An apparatus for authenticating a hardware token for operation with a host, the apparatus comprising a processor and a memory storing instructions for performing steps comprising the steps of:

retrieving a value X from [[a]] the memory accessible to an authenticating entity, the value X generated from a computer fingerprint F of the host and an identifier P securing access to the token, wherein the host fingerprint F is computed at least in part from host information C;

regenerating the same identifier value P at least in part from the value X and the fingerprint F; and

transmitting the regenerated identifier P to the token to authenticate the token for operation with the host.

65. **Canceled**

66. **(Original)** The apparatus of claim 64, wherein the host fingerprint F is computed at least in part from host information C and a server specific value V .

67. **(Original)** The apparatus of claim 64, wherein the host fingerprint F is computed at least in part from host information C , a server specific value V and a fixed string Z .

68. **(Original)** The apparatus of claim 64, wherein the value X is computed in the token.

69. **(Original)** The apparatus of claim 64, wherein the value X is computed according to $X = f(P, F)$, wherein $f(P, F)$ is a reversible function such that $f(f(P, F), F) = P$.

70. **(Original)** The apparatus of claim 69, wherein $f(P, F)$ comprises $P \text{ XOR } F$.

71. **(Original)** The apparatus of claim 64, wherein the value X is further computed at least in part from a user identifier U .

72. **(Original)** The apparatus of claim 71, wherein the value X is computed according to $X = f(P, U, F)$, wherein $f(P, U, F)$ is a reversible function such that $f(f(P, U, F), U, F) = P$.

73. **(Original)** The apparatus of claim 72, wherein $f(P, U, F)$ is $P \text{ XOR } U \text{ XOR } F$.

74. **(Original)** The apparatus of claim 64, wherein:

the authorizing entity is a host computer communicatively coupleable to the token; and
the value X is stored in the host computer.

75. **(Original)** The apparatus of claim 64, wherein the value X is stored in a memory of the hardware token, and the processing steps further comprise the steps of:

computing a reference value H associated with the value X; and
associably storing the value X and the reference value H in a memory of the token.

76. **(Original)** The apparatus of claim 75, wherein the instructions for retrieving the value X comprise instructions for performing steps comprising the steps of:

computing the reference value H at least in part from the fingerprint F; and
retrieving the value X associated with the reference value H.

77. **(Original)** The apparatus of claim 76, wherein the instructions for computing the reference value H at least in part from the fingerprint F comprises instructions for computing H as a hash of the fingerprint F.

78. **(Original)** The apparatus of claim 75, wherein the reference value H is computed at least in part from a hash of the fingerprint F.